



AIR WAR COLLEGE

RESEARCH REPORT

AIR FORCE WEIGHT AND FITNESS PROGRAMS

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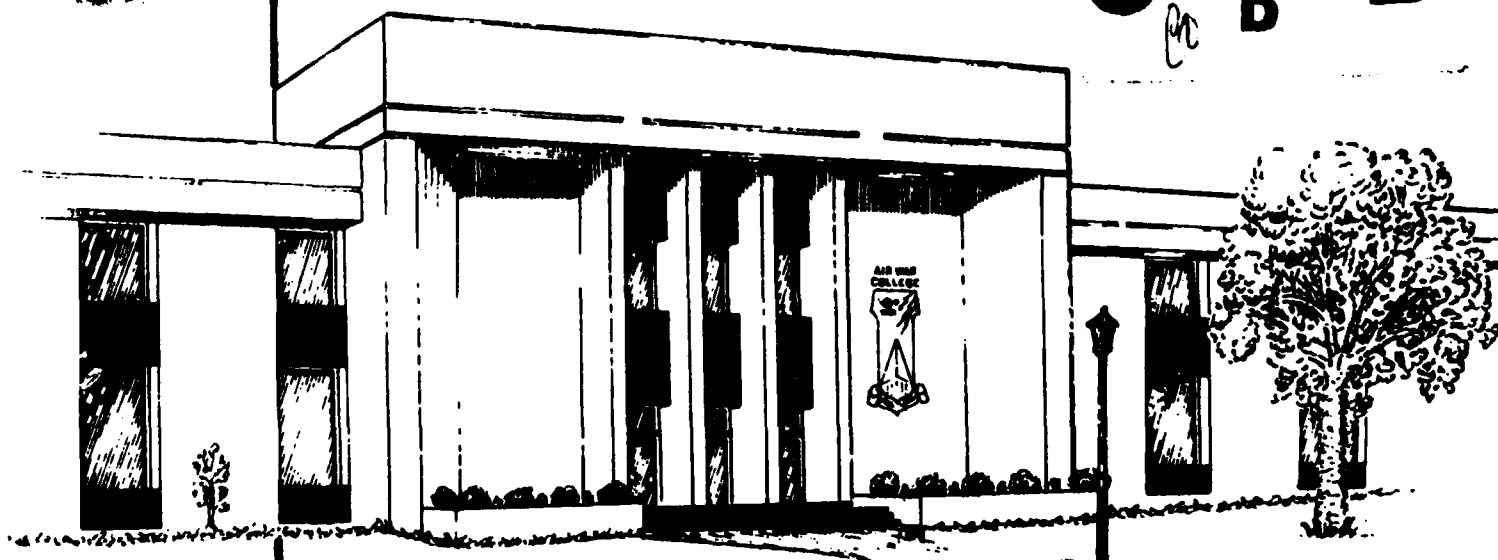
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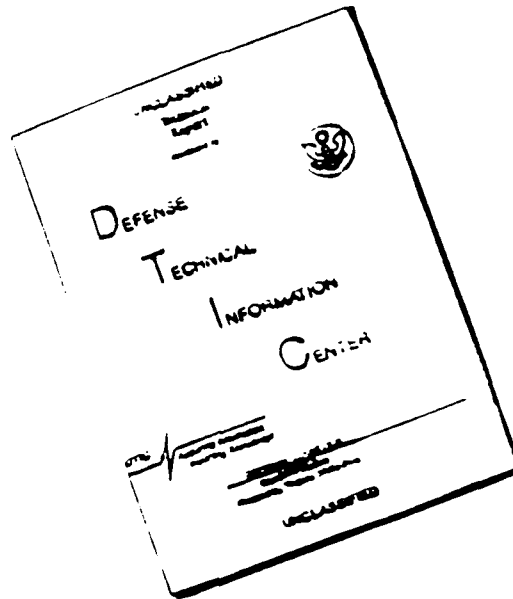
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AIR WAR COLLEGE
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AIR FORCE WEIGHT AND FITNESS PROGRAMS

by

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A DEFENSE ANALYTICAL STUDY SUBMITTED TO THE FACULTY
IN
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Advisor: Colonel Frank W. Anderson, Jr.

MAXWELL AIR FORCE BASE, ALABAMA

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EXECUTIVE SUMMARY

TITLE: Air Force Weight and Fitness Programs

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A review of the DoD policy on physical fitness and weight control programs establishes a focus for a review and assessment of the Air Force Weight and Fitness Programs. The DoD Directive 1308.1 provides straightforward but not totally unambiguous guidance. In implementing the DoD directive, the Air Force elected to shift emphasis from physical fitness to weight control and over the last 20 years transitioned from a physical fitness program to evaluation only.

By combining weight control and physical fitness into one regulation, confusion in the field has developed because of the different orientations of these two programs. The "compliance oriented" weight program is producing satisfactory results while the physical fitness (evaluation) program is not insuring physically qualified personnel. Documented research supports this position. Specific areas of concern are explored and critiqued. The more aggressive fitness programs of the Army and Marine Corps serve as models for a more viable Air Force program. Overall, suggestions for improvements in the weight control program

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and for revitalization of the physical fitness program are presented for Air Force consideration.

BIOGRAPHICAL SKETCH

Lieutenant Colonel Brian P. Quarrie (B.S. Physical Education, Iowa State University; M.A. Public Administration, Auburn University at Montgomery) has been interested in physical fitness since his involvement in college gymnastics and athletic training at Iowa State University. He served in the Strategic Air Command from 1971 to 1976 and observed less than enthusiastic support for physical fitness. In 1975, he returned to Air Training Command as an instructor pilot and witnessed the removal of physical fitness instructors for undergraduate pilot training. For 19 years, he has observed a gradual decline of emphasis on physical fitness in the Air Force and has been genuinely concerned with this adverse trend. He is a graduate of the Squadron Officers School, the Air Command and Staff College, and the Air War College Class of 1989.

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Chapter I

No man expects to live forever. But
the man in perfect physical condition
will live longer--especially in combat.

Hap Arnold

INTRODUCTION

As long as man has been on the planet earth, his primary goal has been survival. Whether one subscribes to the concept of "survival of the fittest" or divine evolution, the reality is that man, in his quest for survival, down through the ages, has become less physically involved with his environment and more and more dependent on machines and technology. This transition from "back power" to "brain power" has had a negative impact on man as a physiological being, especially to his heart. Lack of vigorous physical activity, both at work and at play, contributes to a continuous decline in physical fitness in the American public and a continuous increase in heart attacks.

America is rapidly becoming a nation of soft out-of-shape men and women who cannot endure for an hour the kind of stress that our ancestors faced daily. Today the typical American is older physically than years give him the right to be. The average young man in this country has a middle-aged body. And the average middle-aged man... is close to death. He is only one emotional shock or one sudden exertion away from a serious heart attack. (5:15)

The DoD shares this concern for the effects of declining physical fitness. Military personnel must be able to handle the rigors of military duty; the taxpayers expect it and depend upon it. Therefore, the DoD directed the Services to establish viable Physical Fitness and Weight Control Programs consistent with their missions. This author contends that the Air Force's current, "hollow" physical fitness program exists to satisfy the DoD edit and does not provide for an effective program. A sound credible fitness program, tailored to the Air Force's needs, is required.

Additionally, the current fitness program's linkage to weight control should be severed; the cause and effect relationship of good physical fitness in eliminating weight control problems is too simplistic. Weight control problems require a much broader package; a wellness package that includes physical fitness as well as diet therapy, stress management, and other scientifically approved techniques. Separating the "compliance-oriented" Air Force Weight Program from the Fitness Program, a "decaying program" that should be motivational, deserves consideration. The logic of isolating these weakly-related programs will be developed in this paper by reviewing the implementing objectives of the DoD policy on physical fitness and weight control; by assessing the Air Force's efforts in these areas; by comparing the physical fitness programs of other Services

(primarily Army and Marine Corps); and by providing suggestions for enhancing the current Air Force Weight and Fitness Programs.

The importance of both of these programs is recognized; however, the present Air Force emphasis on weight management over physical fitness requires rebalancing. The DoD directive clearly establishes physical fitness as the essential program for combat readiness and the weight control as the component of a viable physical fitness program. The Air Force should realign its efforts to mirror the DoD policy.

Limitations

This paper reflects a narrow prospective of the total Air Force wellness philosophy being developed; only the Air Force Weight and Fitness Programs are addressed in any detail. Unfortunately, the limited detail and most of the information on these programs came from regulations, research studies, and some reluctant support from Air Force agencies. Getting current information on the changes and the status of the present weight and fitness programs initiatives proved difficult. The offices of primary responsibility for these programs were unable to provide up-to-date information because the staffing processes were not completed. It appears the information is sensitive

enough to warrant limited access; which makes it difficult to forecast what changes are imminent.

Assumptions

The Air Force Weight Program is basically sound, while the Fitness Program is generally perceived as weak. The way the Air Force implements the basic concept of Aerobic training is not working.

Changes from the field, senior leadership, and researchers are being considered. Faced with the bombardment of recommendations aimed at improving the "broken" physical fitness program, the Air Force can not ignore the issue. This author assumes the Air Force wants to implement a viable physical fitness program with the least cost in dollars and manpower. Additionally, aggressive fitness programs, like those employed by the other Services (Army and Marine Corps), may serve as models but are not suited to Air Force needs as they stand--the mission of the Army and Marine Corps are manpower intensive and focus on marching and upper body strength. The challenge for the Air Force is to develop an effective physical fitness program tailored to its needs. The talent, knowledge, and willpower are available; once the decision is made, the problem can be resolved.

Chapter II
DOD DIRECTIVE 1308.1

General

The foundation of the current Air Force physical fitness and weight programs is based on the Department of Defense Directive (DODD) 1308.1, dated 29 June 1981. The general policy of this directive states that each service member "must possess the stamina and strength to perform successfully any potential mission." (20:1) In approximately six pages, guidance for the general health and well-being of DoD military personnel through physical fitness and weight control emerges. A general overview of the directive and some supporting research will facilitate a better understanding of the DoD policy on physical fitness and weight control.

PHYSICAL FITNESS

According to the DODD, physical fitness is essential for combat readiness. Primary emphasis is focused on quality programs to develop and maintain physical fitness, with secondary importance being placed on evaluation and testing. This is a logical way to set up a viable program and reflects Dr. Kenneth Cooper, Dr. George Sheeham, Bruce Sharkey and hundreds of other physical fitness authors who prescribe basically this same approach; training that starts

at an easy, less strenuous level, increases gradually, and uses feedback to evaluate performance. (9:100; 8:6; 2:75-81) In fact, the directive's concepts for developing physical fitness evolved from Dr. Cooper's ideas--a program tailored for specific needs, regular exercise (3 to 4 times per week), and strenuous enough to provide a training effect. (3:16) The central focus of this physical fitness concept is cardiorespiratory endurance, or aerobic exercise.

In the 1960's, Dr. (Maj) Cooper researched cardiorespiratory endurance while on active duty in the Air Force. His detailed research made common knowledge some scientific information about human physiology. Information previously reserved for medical students and exercise physiologists was now provided for laymen. He explained that cardiorespiratory endurance, generally recognized as Aerobics, depends on the diffusion of oxygen from the air sacs of the lungs into the pulmonary capillaries and into the working muscle cells. Aerobic fitness was the ability to take in, transport, and use oxygen. (8:12,23) This process depended on maximal oxygen uptake ($\dot{V}O_2$ max), and was used to evaluate how efficiently an individual uses oxygen. Oxygen consumption was related to active muscle mass and equated by dividing oxygen consumption (measured in milliliters consumed per minute) by body weight (measured in kilograms). As a point of reference, the average male college student uses 44 to 48 milliliters per kilogram per

minute (ml/kg/min) and the average female student uses 37 to 41 ml/kg/min. (8:13) These values were derived through costly, time-consuming laboratory procedures. Dr. Cooper's trail blazing "Aerobics" provided an alternative, less costly, measuring method with a coefficient of correlation of 0.90; i.e., a method that predicts the $\dot{V}O_2$ max with a confidence level of 90 percent. The aerobic's program placed individuals into fitness categories (very poor; poor, fair, good, excellent) based on oxygen consumption within age categories (under 30, 30-39, 40-49, 50+) through the use of a field testing methodology. Initially, a 12-minute field test was administered in which an individual covers as much distance as possible in 12 minutes. The distance covered was converted to oxygen consumption by employing a correlation table. However, the researchers had to round-up the individuals along the test track to verify how far they had run. In order to simplify the administration of the test, a new standard based on time required to run 1.5 miles was devised. It also provided a one-stop finishing line. To make it even easier, a system was provided to convert ml/kg/min into points (1 point = 7ml/kg/min). (3:28-31,79) Dr. Cooper provided a quantifiable system that showed aerobic exercise was best for cardiorespiratory endurance training. Unfortunately, the emphasis of this program centered on running, an exercise only 10-15 percent of the population takes to naturally and enjoys. (9:25) As the

fitness craze caught on, happy runners and "forced" runners pounded out the miles. The negative feedback from disillusioned runners encouraged Dr. Cooper to revise his earlier belief that more was better and led him to develop a balanced program that reduced the mileage per week and also decreased the incidence of joint and bone injuries. This new approach to fitness expounded that "if you run more than 15 miles per week, you are running for something other than fitness." (1:13)

The 1.5 mile run is not the only way to estimate cardiorespiratory endurance. Another less traumatic method of correlating VO_2 max and cardiorespiratory endurance is through a cycle ergometer test, a research grade, stationary bicycle. The test employs computer software, a heart rate monitor, ergometer cycle, and a metronome. This technique will be addressed in chapter III when the UASF Firefighters Fitness Program is discussed.

Basically, the cycle ergometer or any physical exercise can be evaluated for effectiveness by correlating VO_2 max against the training heart rate as an indicator of energy being expended and oxygen being consumed. By employing the Karvonen method, a conversion of a percent of maximum heart rate to an equivalent percent of VO_2 max (percent max heart rate = VO_2 max) is made. At a minimum of 70 percent maximum heart rate, a "training threshold" is reached and at approximately 80 percent maximum heart rate, a range of

anaerobic exercise or oxygen debt exercise is reached. Exercise at more than 80 percent heart rate leads to decreasing performance as an oxygen debt in the muscle cells develops and the muscle fatigues. Optimum training occurs when exercising between 70 and 80 percent maximum heart rate; in the training zone where oxygen is replenished and the muscle is revitalized. At the lower end of the training zone (70 to 75 percent), the predominant training effect is muscular strength; while at the upper end of the training zone (76 to 80 percent), the predominant training effect is central circulatory or endurance. (8:36-41) Percent of maximum heart rate can be approximated for males by taking 205 minus $1/2$ their age (or for females by taking 220 minus their age) and dividing this number into their exercise heart rate. It is preferable to take the actual exercise heart rate at the wrist; carotid artery rates may be lower than the actual rate due to the feedback pressure on the artery slowing down the heart rate 3 to 4 beats per minute. (1:125) Taking the exercise heart rate as quickly as possible (6 second count times 10) provides an excellent estimation of exercise heart rate. To determine the VO_2 max, compare the percent of maximum heart rate to a conversion chart; 70 to 80 percent of max heart rate is equivalent to 55 to 70 percent of VO_2 max.

WEIGHT CONTROL

The DODD's primary emphasis in weight control is "to establish a uniform system and standard for weight control and obesity applicable to all DOD military personnel and to provide standards that enhance the attainment and retention of good health, physical fitness, and a trim military appearance." (20:2)

A need for a new uniform system for determining military weight standards became graphically clear after it was discovered that the weight standards being used were based on actuarial tables from insurance companies. These statistics reflect the average of weight of people who had died and were not founded on any scientific research. They were merely reflections of what was happening to the population and not what was physiologically supposed to be happening. The medical community responded with some enlightening physiological facts once this disturbing information surfaced. For example, as an individual gets older, bone and muscle are replaced by fat. After the age of 21, any pound gained is probably fat. (9:137) It was estimated that 60 percent of the American population was overweight. Additionally, a linkage between exercise, fat metabolism and weight control highlighted the real problem--people did not need to merely lose weight, they needed to lose fat. One path to better fat control was

through exercising muscle cells which are highly efficient users of fat. (8:99) Another path was through the control of calorie intake, both total amount of calorie intake (something less than basal metabolism plus energy expended) and the type of calorie (less fat in the diet). Diets containing less fat were highly recommended. The predominant philosophy on calorie consumption and dieting recommended a balance of 50 percent complex carbohydrate, 20 percent protein, and 30 percent fat. (1:37) As a reference, the American Heart Association reports total fat intake is nearly 40 percent currently. (24:7)

Armed with this information, DoD tables for maximum allowable weight (MAW) were developed and uniformly established "percent body fat" as the determinating measurement. DoD goals were set at 20 percent body fat for males and 26 percent body fat for females. The male and female tables based on height-to-weight ratio are indirect indicators of body composition and were designed to serve as a screening technique until validated composition measurement techniques were in place servicewide.

Hydrostatic weighing, recognized as the most reliable method of determining body fat content, is too time consuming and costly for the services to employ. A variety of preferred techniques have surfaced--skinfold calipers, circumference measurements (one-point, bicep; two-point, neck and abdomen; or three-point, neck, abdomen, and hips),

and combinations of circumference and height. But no one body fat composition measurement technique has won servicewide approval.

SPECIFICS

Physical Fitness

In the area of physical fitness, the directive covers program design, evaluation, command emphasis, objectives, motivation, and monitoring systems.

Program Design

The direction in program design is to "implement physical fitness programs...tailored to suit the particular needs and missions of each Service...with exercise recommended three to four times per week at a degree to promote a training effect." (20:Encl 2)

Evaluation

Evaluation guidance calls for, as a minimum, physical fitness tests (PFTs) that evaluate stamina or cardiorespiratory endurance. This presents some problems for interpretation since stamina is defined in the directive as "an alliance of cardiorespiratory endurance, strength, and muscular endurance and the ability to persist in continuous physical activity without rest." (20:Encl 1)

Therefore, as a minimum, the PFTs need only measure cardiorespiratory endurance depending on which side of the "or" you select. Even if stamina were selected, since the directive makes strength testing an optional component, the only two things that would need to be evaluated would be cardiorespiratory endurance and muscular endurance; which the Army, Navy, and Marines use.

Another DODD requirement establishes systematic and regular evaluations, scored for record at least annually. It would appear that the intent is to evaluate fitness more than once a year and record it at least once a year. Additionally, the directive calls for an incentive system for those who are evaluated at the outstanding levels of physical fitness or who make substantial improvement. Appropriate recognition is directed. The key words here are "and make substantial improvement" and appropriate recognition. (20:1) All the Services employ liberal interpretations of the recognition guidance.

Command Emphasis

Command emphasis rests on the personal involvement and support of commanders, "all commissioned and noncommissioned officers are expected to support the program, maintain a high standard of personal fitness, and to be well informed in the conduct and execution of physical training." (20:1)

This is perceived to be more a plea for support than a statement of policy.

The specific objectives of the physical fitness program do not direct but merely recommend that training and activities be designed to develop physical skills needed in combat. No mention of physically demanding peacetime skills appears but logic would indicate they be included in a sound program. Sports programs may be employed to sustain fitness and build stamina but are not substitutes for viable physical fitness programs. Credible physical fitness programs must be "carefully planned and supervised." (20:1)

Motivation

To make Service programs more attractive, the following motivational points are recommended by the directive as a minimum: rewards and incentives for outstanding performance; corrective action for failure to meet required standards; physical fitness comments on efficiency on fitness reports; and variety and challenge. These motivational techniques can be employed to encourage or to threaten individuals to comply.

Monitoring System

The Services are required to provide assessments of their physical fitness programs periodically. These internal assessments comprise the DoD's monitoring system.

(20:1) This is a little like putting the fox in-charge of guarding the chicken coup and holding him accountable for inventory control.

Weight Control

The directive provides guidance through objectives, policy, procedures, and a monitoring system on weight control.

Objectives

The objectives call for a "uniform system and standards for weight control and obesity for all DoD military personnel, to provide standards that encourage "the attainment and retention of good health, physical fitness, and a trim military appearance." (20:2) The public still thinks of military personnel as lean, fighting machines.

Policy

The policy is straight forward--the DoD goal is 20 percent body fat for males and 26 percent body fat for females. Services have the option to be more restrictive on the percent of body fat.

Procedure

Procedurally, the Services are to devise a preferred measuring technique that is reliable with a coefficient of

correlation of 0.75 or greater to hydrostatic weighing. Body fat measurements are recorded when a "service member exceeds the weight parameters of the height-to-weight table; when appearance suggests an excess of body fat; and annually, when required to take the PFT." (20:2) If a service member is overweight, they are referred to medical authorities for evaluation before being placed in a body fat reduction program. The emphasis is to be placed not on weight loss but on reduction in body fat.

Monitoring

To keep everything on track, each Service must establish a mechanism for monitoring the progress of their weight control programs. (20:2)

When an individual fails to meet the standards of either the fitness or weight program, remedial training is provided. Lack of progress in meeting the standards, without a medical excuse, will be reflected in comments on efficiency or fitness reports. Continued failure will result in consideration for administrative separation. (20:2) A logical progression if the individual can not or will not comply with established DoD or Service policy.

MEDICAL SCREENING

Medical screening procedures, or lack of them, will not be addressed in this paper. Enclosure 4 of DODD 1308.1

provides a generalized approach to screening which includes suggestions but little else. With the wealth of information available from sports medicine clinics, more attention to this area is warranted but not by non-medical personnel.

Chapter III

AIR FORCE REGULATION 35-11

Air Force Regulation (AFR) 35-11, the Air Force Weight and Fitness Programs, 10 April 1985 (with Change 1, 20 May 1986, and Change 2, 30 June 1987) implements DODD 1308.1, 29 June 1981. An exhaustive analysis, paragraph by paragraph, is not within the scope of this paper. The issues to be explored center on Air Force compliance with the DODD 1308.1 and on Air Force achievement of its stated objectives.

In general, AFR 35-11 meets the minimum requirements of DODD 1308.1 as the Air Force has elected to interpret it. For the most part, the letter-of-the-law appears to be supported, but the spirit requires reviving. For example, in the area of weight control, the Air Force regulation established weight standards that have proven legally sufficient to support administrative actions but have not proven effective in facilitating lifestyle changes. A majority of individuals that enter the Air Force Weight Management Program (WMP) reenter again or separate from the service, administratively or voluntarily because of overweight problems. (34:--)

AFR 35-11 is the reverse image of DODD 1308.1. The DODD starts with the development and maintenance of physical fitness as the primary emphasis and follows with weight control as a supplement to this fitness objective; while the

Air Force focus is on the weight program which is supplemented by a fitness program. This subtle transfer of physical fitness and weight programs emphasizes more than mere preference, it reflects a transition from a proactive DoD physical fitness effort to a more reactive Air Force approach.

WEIGHT CONTROL

AFR 35-11 states that weight management is an individual's obligation and that each individual "is responsible for developing and maintaining a lifestyle that includes a properly balanced diet and an effective physical conditioning program." (11:8) To help in this effort, the Air Force Weight Program establishes standards of weight and provides a rehabilitation program for those not in compliance with the standards. Therefore, the Air Force Weight Program really establishes the limit for acceptable weight and holds the individual responsible for meeting the standard not for developing and maintaining a proper balanced diet and an effective physical conditioning program. If an individual is under the maximum allowable weight (MAW) no one appears to be concerned with that individual's diet.

Weight Program Objectives

The three objectives of the Air Force Weight Program are to:

- 1) Establish a uniform system for weight management for Air Force people.
- 2) Provide standards which enhance the attainment and retention of good health and physical fitness.
- 3) Enhance the overall appearance and effectiveness of the military organization.
(11:8)

The only difference between the Air Force Weight Program objectives and the DoD objectives is the Air Force addition of the phrase "enhancing effectiveness in the military organization". Otherwise, the Air Force Weight Program lists the same objectives as the DODD. But how effective is the Air Force program?

As for the first objective, the Air Force Weight Program is administratively sound and provides a uniform system for weight management. Responsibilities are clearly delineated in 15 information-packed pages. There is little doubt as to what to do administratively with an overweight individual.

In the support areas, however, some room for improvement may be warranted for various agencies. For example, the Chief of Morale, Welfare, and Recreation is responsible for developing a broad sports program and

providing athletic facilities, yet no mention is made for ensuring that athletic facilities are manned with physical fitness specialists who have attended the USAF Fitness Specialist Course. (10:--) This two week fitness course provides a solid overview of the wellness process through a systematic development of the concepts of wellness, safety guidelines, nutrition, physiology, exercise benefits, smoking cessation, stress management, medical and health screening, fitness assessment and goal setting, and exercise guidelines that would enhance Fitness Improvement Training programs. All enlisted ranks are trained in the academics of wellness, the relationship of exercise to weight control, and participate in physical fitness evaluations. The course parallels Dr. Cooper's latest philosophy on well-being through a balanced, synergistic approach to physical and mental wellness. (1:11,10:--)

Support from the Director, Base Medical Services currently involves evaluating overweight individuals but does not require a body fat determination. AFR 35-11 allows the unit commander to evaluate overweight individuals by using either height-to-weight tables or a nomogram (a conversion table that compares circumference of flexed biceps for males or forearm measurements for females, height and weight). The accuracy of this one circumference nomogram method, especially in the hands of an inexperienced commander, is questionable. Why the better qualified

medical personnel are not required to provide this information is not clear. The DODD requires percent body fat measurements be applied and recorded but the Air Force still employs an optional approach to body fat determinations. The result is that personnel in the Air Force can be on the Weight Management Program and not be overfat. (11:12) Putting an overweight, not overfat, muscular individual on a low calorie diet may prove frustrating and counterproductive since it takes up to 3 weeks of faithfully eating less before a pound of weight is lost. (14:13) And the loss could be in muscle mass. Likewise, a flabby overweight individual placed in an exercise program may appear to be gaining weight initially as fat is replaced by more dense muscle tissue. Without a body fat determination, the individual's progress may appear unsatisfactory; when, in reality, the individual may not be losing weight but is losing fat and is making progress. Body fat determination is the best way to measure progress and the medical community should provide this determination.

More involvement is needed from the medical community in providing credible body fat information. More reliable body fat measurement procedures than those found in the Air Force Regulation 160-17, Physical Examination Techniques, need to be employed. The Army replaced skinfold estimations with an enhanced circumferential method of determining body fat composition: 3 factors for males (abdomen, neck, and

height) and 6 factors for females (hip, neck, forearm, wrist, height , and weight). The Air Force, during a study of the physical fitness status of firefighters, elected to determine body fat composition through anthropometric measures using circumference of abdomen and neck for males and abdomen, neck, and hip for females. (25:22-25) Once a more reliable measurement technique is selected, it needs to be consistently applied.

Medical support for diet counseling is sound under AFR 35-11 and uses a balanced approach to weight reduction--diet and exercise. Books, pamphlets, articles in newspapers and magazines, and research studies emphasizing the synergistic relationship between exercising and dieting are readily available. The pamphlets listed in AFR 35-11 provide informative reading on the principles for dieting. They emphasize decreasing caloric intake and increasing caloric output, and warn against fad diets ; i.e., liquid protein, Stillman, and Atkins diets. (15:31) Diet counseling, in the Air Force, provides solid initial counseling support for the weight program, but more follow-up diet counseling is needed.

It is generally recognized that weight loss for overweight people requires behavior modification, not just less food. Since weight is gained gradually over time, only a commitment to new, sensible eating habits over time will reverse the process. Unfortunately, in the majority of

cases, this behavior change lacks medical supervision --initial counseling, reading material, and periodic follow-up counseling are not supervision. Rightfully, the individual assumes responsible for his own program, but more professional involvement should be provided.

The family is invited and strongly encouraged to attend counseling to build a support group for the overweight individual. To assist in this effort, the Air Force developed (borrowed from the Army) a Family Fitness Handbook to encourage family lifestyle modifications in supporting the individual's program. (16:--) The family serves as an excellent starting point for a support base considering that repeated failure to maintain Air Force weight standards can lead to administrative separation for the individual and loss of income for the family.

To supplement the family support program, some form of supervised group support should be considered. Supervised support groups have proven productive in other rehabilitative programs (i.e., alcohol and drug) but have not been considered productive or necessary for military weight control rehabilitation. Commercial programs, like Weight Watchers, employ support groups of friends and co-workers who work together over a series of meetings to encourage each other in weight loss. (30:--)

The second Air Force Weight Program objective to provide standards which enhance the attainment and retention

of good health and physical fitness falls short of its goal. The thrust of AFR 35-11 is on enforcing weight standards, not on good health or physical fitness. The focus is on rehabilitation. This reactive philosophy favors the development of enforcement tools, using fear as motivation, rather than on the proactive development of viable weight programs to encourage good health practices. Not until an individual becomes overweight or indicates high blood cholesterol does the Air Force become active in the individual's good health and eating practices.

Developing a preventive medical approach to weight control by modifying eating habits and emphasizing cholesterol monitoring could enhance the attainment and retention of good health and physical fitness. Experts are expressing the necessity of lowering saturated fats consumption and monitoring cholesterol levels. Dr. Cooper's Controlling Cholesterol graphically illustrates, in controlling cholesterol, the perils of high cholesterol and the impact on heart disease. (4:--) In, Eat to Win, Dr. Robert Haas, a clinical nutritionist, provides a guide for peak performance and endurance through a balanced diet that keys on a blood chemistry profile (total cholesterol, high-density lipoprotein cholesterol, glucose, triglycerides, and uric acid) to improve health. (6:39) The American Heart Association cautions against elevated blood cholesterol levels above 200 mg/dl and strongly

recommends reduction in total fats and saturated fats to reduce heart attacks and strokes due to arteriosclerotic vascular disease. (27:1-2) Unfortunately, Air Force medical personnel only recently started evaluating cholesterol levels during physical examinations. Rated personnel are more likely to be alerted to high cholesterol levels since their blood cholesterol is tested during yearly flight physicals. Other personnel may or may not receive blood cholesterol tests during their periodic physicals every 5 years. The earlier an elevated blood cholesterol is determined the better. Since the test is relatively easy to do and inexpensive, the Air Force could and should initially screen all personnel at Basic Military Training, Officer Training School, Air Force Academy, Reserve Officer Training Course, and other accession sources. If this initial feedback, coupled with follow-up tests, produces the desired results of modifying eating and exercise habits, the Air Force will be promoting the attainment and retention of good health and physical fitness.

The third Air Force Weight Program objective of enhancing the overall appearance and effectiveness of the military organization reflects the philosophy "to look good is to be good." The American public's opinion of the effectiveness of the military is based on the appearance of its personnel. No research has been conducted by the military to show the correlations between weight and

productivity. The linkage is indirect in that weight management affects physical fitness and physical fitness has been shown to increase productivity.

PHYSICAL FITNESS

The three objectives of the Air Force Fitness Program are to:

- 1) Ensure Air Force members are physically fit to be trained to military task.
- 2) Establish fitness standards which promote the well-being of all military members, without undue health risks.
- 3) Support total force readiness. (11:23)

These parallel the DODD's objectives. However, the Air Force's approach centers on evaluation standards and not on the development of a physical fitness program.

History

In 1970, the Air Force adopted Dr. Cooper's aerobic exercise system but along the way the emphasis shifted from an aerobic training program to an aerobic/anaerobic testing program (13:7) The Air Force physical fitness program is currently in revision and has been since 1970. Some time prior to 1982, the Air Force determined that its fitness program did "not appear to be contributing to the fitness requirements of its people and mission." (11:23) In 1983 and 1984, the Air Force tested an Enhanced Fitness Program designed to encourage a personal lifestyle that included

regular aerobic and muscular development conditioning. This broader based approach to fitness reflects Dr. Cooper's updated and greatly expanded version of aerobic exercise as presented in his book The Aerobic Program for Total Well-Being. The Enhanced Fitness Program tested 2,200 personnel, selected at random at 22 military locations. During the first phase, no advance notice was allowed prior to testing. Evaluation included body-weight measurements, 1.5-mile run, and a 1 minute sit up test. During the second phase, 18,000 personnel at 7 military locations received advanced notice and training and then were evaluated on body-weight, 1.5-mile run, and a 1 minute sit up test.

(28:8) The documentation of the results of these tests were not made public; but basically, the first phase showed that individuals could not meet the desired enhanced standards; the second phase showed that with prior training, personnel could meet the enhanced standards. (28:8) What is not mentioned is that even in the second phase, while the younger personnel passed, the more senior personnel did not do as well. This may explain why the Air Force is still finalizing implementation of the enhanced program. If looking good is more important than being good, then it is possible the senior personnel, in the Air Force, are reluctant to implement a program that will uncover past programs that produced more image than substance. Additionally, there also may be resistance because new

initiatives may be too costly in dollars and manpower to implement. The tests did produce, however, an excellent wellness training pamphlet. The Enhanced Fitness Program pamphlet evolved from Dr. Cooper's The Aerobics Program for Total Well-Being and subsequently became the Air Force Pamphlet (AFP) 50-45, 8 December 1987. This pamphlet recommends a wellness lifestyle by practicing proper nutrition, good health, weight management, smoking cessation, and stress management coupled with regular aerobic exercise. (13:1)

Fitness Program Objectives

The first program objective in AFR 35-11 highlights the problem the Air Force has with implementing a sound, physical fitness program. It is difficult to ensure Air Force members are physically fit to be trained to military tasks when there are no established standards for Air Force military tasks. The only published, documented research study that measures workloads required to perform military work tasks is a 1983 to 1984 physical fitness evaluation of Air Force firefighters. In this research, it was discovered that search and rescue operations were too strenuous for the majority of firefighters. "An alarmingly high percentage of professional Air Force firefighters lacked the physical strength and/or stamina, to successfully perform critical tasks" related to their mission. (23:1) These same

firefighters had successfully passed their annual physical fitness evaluations but failed in this supervised research. The study concluded that

"on the average, young firefighters enter the career field for training and are already below average in physical fitness and are above average in body fat content. With age, the firefighter's fitness level deteriorates to the point that he can not perform strenuous physical tasks related to the firefighting mission." (23:11)

Therefore, since firefighters are able to successfully pass the Air Force fitness evaluations, and since they failed to accomplish a work-related task, the Air Force Fitness Program is not ensuring firefighters are physically fit to be trained to military tasks.

A similar unpublished fitness study was conducted for Prime Beef Runway Repair Teams and produced basically the same results. More studies of this nature are required for physically demanding tasks if the Air Force hopes to develop reliable fitness standards and evaluations. Additionally, as highlighted by the Enhanced Fitness Program, the annual physical fitness standards need to ensure a higher level of endurance and strength.

To ensure that the firefighters did not regress in endurance or strength, an aggressive, organized physical fitness program was implemented Air Force-wide. This program applies to all personnel involved in situations where routine and emergency firefighting is required. The program

is designed to produce the maximum results in the minimum time. It targets improvements in muscular strength and cardiovascular endurance. Initial strength and cardiovascular endurance tests are used to establish a baseline from which a tailored physical fitness program is developed.

Cardiovascular endurance conditioning employs a 16 week training program using a cycle ergometer. A fitness monitor administers the computer exercise profiles. Periodically, a series of aerobic capacity ($\text{VO}_2 \text{ max}$), cycle ergometer tests are used to validate training. The test series consists of a first test where the firefighter pedals the cycle ergometer at exactly 50 revolutions per minute, heart rate is monitored through a heart rate monitor and the workload (tension) is controlled. By comparing the firefighter's heart rate against the known workload an estimation of $\text{VO}_2 \text{ max}$ is derived. After 2 or 3 tests, the computer can predict aerobic capacity based on the results of each of the tests. If the firefighter performs at a submaximal level, the computer will provide a printed, detailed 16 week training program. (25:32)

Strength training involves exercising the large muscle groups in the upper and lower body. Basic bench pressing, leg pressing, curls, and upright rowing are used. A progressive program using increased weight and repetitions is administered by a fitness instructor/trainer. Sit-ups

for abdominal development round out the strength training program. (25:33)

Another disheartening discovery of the firefighter's physical fitness study showed the average Air Force firefighter, at 29.3 years of age, had a body fat content of 20.3 percent. (23:7) The average firefighter exceeded the Air Force body fat standard and very few of them were enrolled in the rehabilitative weight management program. Involvement in the Firefighter Physical Fitness Program, produced a marked improvement in body fat composition and in cardiovascular endurance, 15 to 20 percent VO_2 max in the first four months. (25:33)

The methodology of determining the firefighter's physical fitness status and the implementation of the enhanced training program for physical fitness should be considered in constructing future Air Force fitness programs.

The second program objective to establish fitness standards which promote the well-being of all military members, without undue health risks, was likewise invalidated by the research done on the fitness status of USAF Firefighters and Prime Beef Runway Repair Teams. These studies graphically showed that individuals, responsible for their own physical fitness programs and successfully passing the annual physical fitness evaluation, could deteriorate physically; thus documenting that its physical fitness

program was not contributing to the fitness needs of its personnel or mission. In 1985, the Air Force even referred to this fact through a disclaimer statement in AFR 35-11 acknowledging that the program appeared inadequate. (11:23)

How did the Air Force physical fitness program deteriorate to this level? Twenty years ago, Dr. Cooper referenced evidence of the declining physical condition of Americans. He estimated that 80 percent of the American population had unsatisfactory levels of physical fitness and that this was causing men in their 40's and even their 30's to die of heart attacks at an alarming rate. He professed a strong belief that aerobics, "if implemented properly and practiced would lessen the chance of coronary heart disease." (3:11) He then focused his attention from America in general to the American military, comparing 1157 Austrian male recruits and 1370 American male recruits, all in the 18-20 year age group. The Austrians recruits scored 75.3 percent in the top two aerobic fitness categories while the American recruits scored 59.1 percent. The difference was attributed to the Austrian's more physical work and living environment. (3:37) This comparison and other complaints about the Air Force physical training program influenced the USAF Chief of Staff to direct Dr.(Major) Cooper to implement his "Aerobics" program to replace the Royal Canadian Air Force Five Basic Exercise Program (5BX) as the standard Air Force physical conditioning program.

The 5BX program had fallen into disfavor because of administrative problems; with 6 variations of each exercise (toe touching, sit-ups, push-ups, back bending, and stationary running) controversy developed over test results. (23:19-22) The Aerobics program was easy to administer, only one 1.5-mile run, and it was developed by an American.

The hope that this program would improve the physical fitness of Air Force personnel did not materialize. The results of the first two years of the Aerobics physical fitness testing indicated that, on the average, 60 percent of those tested were in less than a good level of physical conditioning. (33:16) Individuals in this category, according to Dr. Cooper's research, lacked aerobic capacity and needed a physical fitness program that earns them at least 30 aerobic points per week until they attain a good level of physical condition. (32:35) Rather than following this sound advice and training these individuals to the good level, the Air Force solved the problem by changing the reporting terminology. The Aerobic test results were now changed to indicate "that more than 98 percent of the male Air Force personnel were in satisfactory physical condition." (33:1) Satisfactory is not one of Dr. Cooper's original 5 fitness categories; it is a generalization that looks good on paper. This high passing rate on the Aerobics test established the emphasis on looking good for the test and defused the need for the 60 percent of those testing in

the less than good category to be in a viable physical conditioning program.

Tasked by the Department of Defense to field a quality physical program, that as a minimum evaluated cardio-respiratory endurance, the Air Force elected to employ the minimum as its standard and focused its attention on evaluation and not training. Response from the field condemned this approach. It was generally believed that the Air Force Aerobics Program placed its emphasis on physical appearance, not on physical fitness. (32:38)

As evidenced by the 1983 USAF Firefighters Physical Fitness Status report, the aerobics program in the Air Force was not working. (23:--) The primary fault for this lack of physical fitness rests squarely on the shoulders of the individual because the Air Force regulation placed responsibility for achieving and maintaining physical fitness on the individual. However, the responsibility for enforcing individual compliance with the provisions of the aerobics program rested with the unit commander. But, as long as 98 percent of the individuals were making satisfactory progress, nobody was terribly concerned. No one reviewed the individual's AF Form 1975 (record of conditioning) to verify if the individual had a viable training program as long as that individual passed the annual evaluation. (32:23-25)

The Air Force Military Personnel Center (AFMPC) is presently staffing an Alternative Fitness Program. This Alternative Fitness Program calls for: more frequent (semi-annual) testing; more rigorous male run standards; deletion of the walk option for those under age 35; more rigorous walk standards; addition of muscular endurance test (sit-ups and push-ups); and addition of tougher fitness "targets" or "goals" for certain key career fields (fighter pilots, firefighters, pararescue personnel, etc.). (28:2)

The need for change surfaced because of complaints from the field, adverse reports, test data, and surveys of senior non-commissioned and commissioned officers. One such survey, accomplished by Majors Fadum and McReynolds at Air Command and Staff College, Air University, Maxwell AFB, Alabama, in 1987, included responses from personnel attending the Senior NCO Academy, Squadron Officer School, Air Command and Staff College, and Air War College. It provides four sound recommendations.

First, the fitness program should be strengthened per the Alternative Fitness Program changes: phasing in tougher 1.5 mile run standards for men, phasing in sit-up and push-up requirements for men and women, and increasing the frequency of fitness testing to at least semiannually (preferably every three months).

Second, Air Force policy should be modified to direct unit commanders to encourage the use of duty time for physical training unless mission requirements dictate otherwise.

Third, the Air Force should develop a comprehensive fitness education program to accompany the enhanced requirements.

Fourth, the Air force should consider authorizing alternative forms of aerobic testing (swimming, cycling, rowing, etc.) to give unit commanders the flexibility of offering comparable alternatives to the 1.5-mile run test when local facilities and resources permit. (28:1)

The report surfaced some interesting facts in the process of supporting these recommendations.

First, the men's minimum aerobic fitness standard is equivalent to Dr. Cooper's "poor" fitness category for all ages while the women's, is equivalent to a "good" (sometimes "fair") fitness category. (28:7) The inconsistency between the standards is disturbing but the "poor" standard for men, coupled with the poor performance of the USAF firefighters, shows why the aerobics program deteriorated. In fact, individuals running 1.5-miles at the "poor" level are probably not doing an aerobic test (between 70 to 80 percent VO_2 max) but an anaerobic test (something greater than 80 percent VO_2 max). The aerobic run originally was set at 1.5 miles because Dr. Cooper felt individuals were "gutting it out" on a one mile run. It appears to this author that individuals running at the "poor" level are "gutting it out" on the 1.5-mile run.

Another surprising fact from this ACSC report was that 11 percent of the surveyed senior NCOs and officers claimed

no past experience with the Air Force Fitness Program; otherwise, they were not participating in an annual PFT. (28:17) This throws a shadow on the administration of the fitness program throughout the Air Force, since the Air Force professes a 98 percent satisfactory rate based on testing.

Distrubingly, the report also disclosed that more than three-quarters of the respondents believed Air Force personnel were physically fit for peacetime conditions but less than one-third felt that Air Force personnel were physically fit enough for wartime conditions. (28:19) What ever happened to "we train the way we fight?"

The desire to have credible physical fitness standards that promote the well-being of the individual, without undue health risk, is difficult. The present low standards can still prove unhealthy to an unconditioned individual. Remember, Dr. Cooper never intended for the Aerobics program to be only a testing program but always stressed a progressive conditioning program. In fact, he states "don't take a fitness test prior to beginning an exercise program if you are over 30 years of age." And the type of training program and physical activity should be an individual's choice (swimming, cycling, jogging, etc.). (3:29) Running is not the only aerobic conditioning exercise; in fact, it may not be a good conditioning exercise for senior personnel, those over 40 years of age. As an individual

ages, the moisture in the cartilage decreases and the elasticity and shock absorption capability of the tissue diminishes, leaving the individual susceptible to joint injury. Therefore, a less traumatic conditioning and testing procedure may be warranted for those 40 years and above. Since the goal of the aerobics run is to indirectly determine cardiorespiratory endurance ($\text{VO}_2 \text{ max}$), a less traumatic method of determining $\text{VO}_2 \text{ max}$ could be the cycle ergometer test being used by the USAF Firefighters as part of their physical conditioning program. (25:9) If running is too traumatic as a conditioning exercise, its probably not a good idea to test using an aerobic run. By ensuring a conditioning program prior to testing and by employing alternative, valid testing procedures, the risk to health can be minimized.

The third Air Force Fitness Program objective to support total force readiness requires the same validation process used to determine the USAF Firefighters Physical Fitness and Runway Repair Teams status. A scientific measurement of wartime skills needs to be developed by either internal assets, i.e., the Engineering and Services Laboratory and the UASF School of Aerospace Medicine, or externally through a private research organization, like Dr. Cooper's Aerobics Center or the RAND Corporation. If the Air Force does not face up to the responsibility of ensuring its personnel are combat ready, the first real test may be

in combat, the wrong time and place to validate weakness in a physical fitness training. The other Services have not scientifically validated their combat physical fitness requirements but the Army and Marine Corps do have aggressive physical fitness programs geared towards combat readiness.

Chapter IV

OTHER SERVICES' FITNESS PROGRAMS

The Air Force physical fitness program differs in many areas from the Army and Marine Corps and to a lesser degree from the Navy. A general overview of Army and Marine Corps' governing directives and the main supporting publications follows to highlight more aggressive physical fitness training approaches. Only a brief review of the Navy's physical fitness efforts will be presented.

Army

The Army Physical Fitness Program promotes combat readiness by developing and sustaining high levels of physical fitness using the following criteria:

- a. Cardiorespiratory endurance.
- b. Muscular strenght and endurance.
- c. Flexibility.
- d. Anaerobic conditioning.
- e. Competitive spirit, the will to win, and unit cohesion.
- f. Self-discipline.
- g. Body composition as regulaed by AR600-9 (weight control program separate and distinct).
- h. A healthy lifestyle that includes good nutrition, avoidance of smoking and drug use, and stress management. (19:3)

These criteria constitute the objectives of the Army's physical fitness efforts as spelled out in Army Regulation (AR) 350-15, effective 18 February 1986. The thrust of this

aggressive physical fitness program is year-round training and physical fitness testing serves as the measurement tool, not the focal point. All Active Army units, individuals, and full-time Guardsmen, and Reservists are required to participate in regularly scheduled (3 to 5 times weekly) vigorous, physical fitness training (PFT) during the unit's normal duty day. Unit commanders may implement more demanding training programs, as long as they do so safely and they adhere to the principles of conditioning identified in Field Manual (FM) 21-20 Physical Fitness Training. (19:4)

All physical fitness training and special, unit-specific physical fitness programs must comply with this manual. This comprehensive directive focuses on cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition. However, body composition (controlled by weight management) is secondary to the first four physiological factors and is a shared monitoring responsibility of the commanders and medical officers.

The training philosophy in FM 21-20 starts with generalized principles of exercise--frequency, intensity, time, and type (FITT)-- and methodically applies them to three phases--preparatory, conditioning, and maintenance. This sound, logical approach to testing is evaluated by an Army Physical Fitness test (APFT) administered twice each year (at least 4 months apart). The APFT consists of three

tests (2-mile run, push-ups, and sit-ups); a minimum of 60 points must be scored on each test. Individuals who score 290 points or above and are not overweight are specially commended with a physical fitness badge. (29:2) No-notice APFTs can be employed to assess unit effectiveness but advance notice is required when the APFT will be administered for record.

Everyone takes the APFT twice a year unless medically exempted. (33:29) Individuals with medical exemptions that can not take the push-up or sit-up events still must take the remaining activities if cleared by medical personnel. The 2-mile run, or an approved alternate activity may be substituted and used for the record. The alternate test is determined by the commander with the support of medical personnel and is administered as outlined in FM 21-20. (19:5)

APFTs are incorporated into every level of training. The Commanding General, U.S. Army Training and Doctrine Command develops the overall physical fitness standards that are used. APFTs are given during the initial entry training while involved in advanced individual training, while assigned to active units, and while attending courses for 56 days or longer at Army Service schools. Passing the APFT is required for graduation. Statistical data on the physical fitness performance of soldiers in initial entry training and military personnel in resident training scores coupled

with the data base developed to monitor officers, warrant officers, and enlisted personnel provides a comprehensive, continuous feedback mechanism to assess readiness.

In addition to this statistical feedback, the Army War College conducts applied fitness research relating to the health and fitness of senior military personnel (40 year old and over) and provides informative feedback on the fitness of this group. Their research helped support the reinstatement of APFT for this over 40 age category.

(19:3-6)

FM 21-20 is a basic, but sound conditioning program encompassing individual and group exercises. Everything from Indian running (group runs consisting of 40 to 50 yard sprints), cross-country running, interval workouts, relays, road marches, swimming, bicycling, walking, to aerobic dancing is allowed to develop aerobic conditioning. Muscular endurance conditioning includes the entire spectrum of isotonic, isometric, to isokinetic exercises performed solo or with a partner. Flexibility is rightfully treated as a separate component of conditioning. The importance of adequate flexibility and stretching to prevent injury is emphasized. Variety to the fitness program comes from grass drills, guerrilla exercises, or obstacle courses--all designed to promote physical conditioning and develop basic soldiering skills. Again, a full spectrum of options are available from individual obstacle courses or circuits to

competitive fitness activities like nine-ball soccer, strategy volleyball, or broom ball hockey. Evaluating the effectiveness of the program is spelled out in detail--the value of testing, administration, and philosophy are all covered. Leadership and Instructor training tie the entire program together--a comprehensive, well-developed program.

The commanders must support and conduct training that meets the needs of the individual and ensure mission readiness. How they tailor the activities in their physical fitness program is a leadership decision. The guidelines established in FM 21-20 provide detailed instruction for conducting physical conditioning and related tests; a one-stop reference source that is credible from a physical education and training standpoint.

The Army's approach to implementing DODD 1308.1 is straight forward. AR 305-15 adheres to the letter and spirit of the directive. In a concise, 5 pages of instruction, the administrative responsibilities, objectives, policy, procedures, testing, incentives and corrective action, safety, sports-related programs, and uniforms are covered or referenced. The key to the success of this program is FM 21-20 and its conceptualization of a viable physical fitness program. Supporting this manual is an extensive structure of feedback, training, and research. Specifically, test results data base feedback provided from the Fitness Training Units (at all Army Training Centers),

the Soldier Physical Fitness School at Ft. Harrison, and the Army Physical Fitness Research Institute that include civilian personnel, contracts, textbooks, equipment and a TDY budget all contribute to a well-organized, clearly focused physical fitness program. The Army is serious about physical fitness.

Marine Corps

Equally serious about physical fitness is the Marine Corps. Mention the word Marine and the image of a highly motivated, physically fit and well disciplined individual springs to mind. Starting with "boot camp", physical fitness indoctrination includes maintaining a healthy body, developing endurance to withstand the stress of prolonged activity and adverse environment, ensuring the capacity to endure the discomforts that accompany fatigue, and the maintaining of combat effectiveness. Attaining and maintaining the desired level of physical fitness depends on a training program that focuses on strength, endurance, agility and coordination. Overload, variety, balance, regularity and progression are the guiding principles of all physical conditioning efforts. (7:168)

The implementing directive for the Marine Corp's physical fitness program is Marine Corps Order 6100.3 that requires commanders to:

- 1) Establish and maintain an effective physical

- fitness program which ensures that all Marines maintain an acceptable level of physical fitness.
- 2) Ensure that all individuals are medically qualified prior to participating in the physical fitness program.
 - 3) Establish a minimum physical fitness program of at least 3 hours per week. Physical training may be authorized on an individual basis at the discretion of the unit commander.
 - 4) Ensure that all Marines participate in physical fitness conditioning activities commensurate with their medical qualifications and limitations.
 - 5) Conduct physical fitness testing for all Marines.
 - 6) Place all Marines who fail to pass the PFT on a daily command-supervised remedial physical conditioning program until they pass the test.
 - 7) Ensure that results of physical fitness testing are entered on section A of the fitness report. Comments are placed in section C in connection with attainment of superior physical performance or a medical excuse from the PFT. (21:6-3)

Similar to FM 21-20, the Marine Corps supplements Marine Corps Order 6300.3 with Fleet Marine Force Publication (FMFRP) O-1 B, Marine Physical Readiness Training for Combat. An informative reference source used to implement a viable physical fitness training program with one goal--to prepare the Marine for combat. In a format resembling that used to develop an operations plan, the reader is taken step-by-step through a basic, multifaceted physical conditioning philosophy. Everything from the importance of physical readiness leadership, to the development of training programs, to physical conditioning activities, to water survival, to competitive activities, to evaluations, to the human body are covered. Noteworthy is the Marine approach to physical fitness through tailoring activities to support endurance and strength required for

specific demands--"the degree of heart and lung endurance necessary to be a reconnaissance scout-swimmer is not necessary to be an artilleryman who must lift scores of heavy projectiles in the firing mission." (7:168) Although specific workload determinations have not been researched, repeated performance of demanding tasks provides feedback on individuals who need remedial training. The "specific" approach to physical fitness produces needed skills for physically demanding readiness tasks.

Training programs include both individual and group activities centered on combat readiness. Detailed descriptions and illustrations are provided to ensure training parallels combat requirements and that conditioning focuses on combat-related benefits to the maximum extent possible. A recent change to reinforce this combat orientation is the revitalization of emphasis placed on confidence and obstacle courses by senior leadership. Sports programs are being down-played.

Primary emphasis in physical fitness is given to training with evaluation being secondary. Commanders are required to spend a minimum of 3 hours per week in physical fitness training. The physical fitness test (PFT) supplements the fitness program. The Commandant of the Marine Corps directed that the PFT be the universal measure of adequate individual physical fitness. (21:6-2) The PFT is not to be viewed as an end product; it is a measurement

device to predict physical fitness. Overemphasis on the PFT might be detrimental to training required to develop the complete Marine. (21:6-2) The PFT (3-mile run, push-ups, and sit-ups) provides solid feedback but only in a narrow range of physical activities.

Other formal tests that commanders may elect to employ are the physical readiness test, the airborne trainee physical fitness test, and the battle fitness test. The physical readiness test is currently administered to all male officer candidates and involves five events (climbing uphill, rope climb, evacuation, advance by fire and maneuver, and forced march) which must be passed with a minimum of 80 points for each event (as determined from a time verses event conversion chart). The airborne trainee physical fitness test requires each Marine to pass a standard in each test event. The standards are: 7 chin-ups, 80 knee bends (2-minutes), 45 push-ups (2-minutes), 45 sit-ups (2-minutes), 2-mile endurance run in 15:45 minutes or less in athletic gear, and 4-mile endurance run in 32 minutes or less in utilities and running shoes. (21:6-4 to 6-14)

To the Marine Corps, physical fitness is essential for readiness but even with this heavy emphasis on physical fitness conditioning and training, the goal is not to develop supermen but to develop men capable of doing the mission.

Navy

The Navy's physical fitness program is less structured than either the Army's or Marine Corps'. The Navy directives are generally less detailed than and, therefore, leave more discretion to commanders in implementation. Physical conditioning programs must consider the limited space available on vessels. SECNAVINST 6100.1, Physical Fitness Program, sets the standards and OPNAVINST 6110.1C, Physical Readiness Program, provides more guidance on specific actions to be taken. Commanders are given wide latitude in the types of training programs they can employ as long as all personnel strive to attain the highest degree of physical readiness. Physical Readiness Tests (PRT) are administered twice every fiscal year (no less than 4 months apart). (22:7) Enclosures to OPNAVINST 6110.1C detail how to conduct the evaluations.

The Navy program is Service specific but does offer one excellent idea in developing a sound physical fitness program. No member can participate in a physical readiness program until their physical examination is completed. Each individual receives a Risk Factor Screening/Physical Readiness Test Results Form which is transferred with the individual throughout their career. This up-front physical examination enhances safety and reduces physical readiness program related injuries.

Chapter V

RECOMMENDATIONS

The Air Force's physical fitness and weight control programs, as directed by DODD 1308.1, are continuously being revised, resulting in the weight control program becoming more complex and the physical fitness program becoming less complex and effective. A major problem confronting those trying to understand the Air Force Weight and Fitness Programs is the weak marriage of a predominately "image" (weight management) program with a marginally productive "performance" (physical fitness) program. In trying to make them equal partners, the implementers have compromised the physical fitness efforts by turning it into the image of an effective performance program. The DoD envisioned weight control as a natural spin off of a good physical fitness program, while the Air Force gives disproportionate emphasis and detail to weight control and too little emphasis to physical fitness. Divorcing the complex weight control program from the fragmented physical fitness program could solve the present dilemma.

Functionally separating the AFR 35-11 Weight Control and Fitness Programs, as they are administratively at AFMPC, into two regulations would allow a clearer picture of the distinct problems surrounding each of these programs. The fact that the Air Force Weight Program and the Air Force

Fitness Programs are handled in separate chapters in AFR 35-11 does not eliminate the confusion generated in the field because of the obvious compliance oriented weight management program and the frail motivational oriented physical fitness program. There is nothing wrong with having different orientations to these two programs but trying to implement them from the same regulation causes problems; as evidenced by the OPRs at AFMPC who are constantly bombarded with questions directed to the wrong functional authority.

Weight Program

Sorting through the abundant details provided in AFR 35-11 on the Air Force Weight Program, three logical suggestions for improvement evolve that may be considered by the Air Force. They are:

- 1) employ a straight forward, medically, verified, percent of body fat as a standard;
- 2) separate military appearance and overfat issues; and
- 3) involve the medical community more fully in the Weight Program.

Although these ideas were alluded to earlier, amplification and rationale for each is needed.

Since 1981, the percent of body fat has been the DoD determining factor in deciding whether military personnel are overweight; however, 8 years later, the Air Force is

still in the process of incorporating this standard. Commanders rely primarily on height-to-weight tables to screen for overweight. Body fat composition measurements are indirectly determined through nomogram techniques that satisfy the liberal reliability coefficient of correlation of 0.75 or greater to hydrostatic weighing as established by DODD 1308.1. But, even the simple nomogram is not automatically included in the medical evaluation. At the commander's discretion, a medical representative (physician, nurse, nurse practitioner, physician's assistant) may determine a body fat measurement (BFM) or the commander can attempt to determine a BFM himself through the use of attachment 4 in AFR 35-11. However, it is legal to enter an individual into the Weight Management Program (WMP) without determining a percent of body fat.

It is suggested that medical representatives, using more reliable techniques (either the Army or Navy techniques--multiple location circumference measurements) should evaluate every person who is not considered in compliance with Air Force weight standards for a percent of body fat determination. No matter how the person is screened, once identified, the medical representative should automatically evaluate that person's percent of body fat. The real health risk is being overfat and the sooner corrective action is started, the better. A direct approach to BFM should be the goal.

At present, the Air Force has taken the DoD goal of 20 percent body fat for males and 26 percent for females as recommendations and has modified its percentages to be less restrictive. These inflated percentages appear to be based on the premise that as one gets older, one naturally gets fatter. The premise is true in fact, as "man" gets older, he physiologically loses muscle and bone mass and replaces them with fat, more fat than is needed. But, that is neither healthy nor what the medical community (civilian and military) recommends--as "man" gets older, he should actually lose weight; he should not replace the loss of muscle and bone with fat. If the Air Force increases the percent of body fat for older personnel, as they have; they are falling into the same dilemma that entrapped the entire military when they employed weight standards formulated from actuarial statistics that reflected what the population was doing, not what they should have been doing. By developing a body fat standard based on statistics of what is happening to the population, in general, instead of developing a physiologically supportable standard based on what should be happening to a healthy military population is creating an illusion. A factual, medically sound percent of body fat must be determined and enforced DoD-wide. There are enough experts in the medical world (dietitians, physicians, physical therapists, sport medicine researchers, etc.) to assist in establishing one overall standard the military can

live with and employ. If left to the Services, the temptation may be too strong to fabricate a standard that reflects the existing military population; a top-heavy population, a population that entered the Service, received training, gained experience, and grew fat with age. It is not unexpected that a Service would expand its standards to retain these valuable assets by employing a percent of body fat that increases with age. In fact, the Air Force and the Navy have two standards, one for 29 years of age and under and one for over 29; both Services employ percent of body fat levels higher than the DoD goal. Top down guidance, DoD to Service, is strongly recommended.

After the DoD establishes a percent of body fat standard, not a goal, the Air Force can fully implement an objective percent body fat standard and reduce the confusion generated by the indirect approach of using weight to get body fat composition. Since fat is the real problem, a more direct, physiologically sound weight control program will evolve.

The suggestion of dealing with the separation of military appearance and overfat warrants consideration. Military appearance (a subjective issue) and overfat (a fairly objective issue) overlap in AFR 35-11. These two issues should be handled separately when the cause of the poor military appearance is not excessive percent of body fat. The present, questionable Air Force guidance is to

adjust a person's weight or body fat percentage downward to correct for a professional military appearance problem even though the person is not overfat. (11:12,17) That is, if a commander feels an individual does not present a good military appearance (a subjective call), but the individual is not overweight or overfat according to height-to-weight charts or nomograms (objective tools), the commander can still use the objective tools to establish a lower weight or fat standard for that individual. Using an objective measuring device to support a subjective decision merely to have an objective foundation for the subjective decision is unsound. A direct approach is more logical--the commander writes down what constitutes proper military appearance, collaborates with medical personnel (physicians or physical therapists) who review or help rewrite the criteria that is medically sound, and inform the individual. Turning what a commander perceives as an appearance problem into a weight problem when it is not, is misapplication of the weight program.

The suggestion to involve the medical community more fully in the Air Force Weight Program is essential to enhance the weight control program. Is being overfat a medical problem? Being overfat is generally recognized as unhealthy, leading to reduced performance of duties. (20:2) The medical factors involved in being overfat reflect

directly on duty performance and concern the individual, the medical practitioner and commander.

AFR 35-11 spells out in detail the role of the commander and the procedures to be followed in helping the overfat individual. But the role of the director, Base Medical Services (DBMS), is only vaguely covered in AFR 35-11. Repeated references to the AFR 160 series makes it clear that the medical community operates out of a different set of instructions. They are not keeping secrets from the commanders who use AFR 35-11; in fact, the simple nonograms in AFR 35-11 are basically the same ones found in AFR 160-17, Physical Examination Techniques. Why the duplication of reference? This duplication of reference has the potential of generating more confusion into the system, especially when new information shows up in one regulation but not in the other. It is strongly recommended that medical issues, like body fat determinations be handled by professional medical personnel and that their regulations contain the pertinent information only. AFR 35-11 should be streamlined to only contain information that is germane to both the medical personnel and the commander; i.e., references to completing and certifying a member's medical evaluation for the commander.

Additionally, it would enhance the weight management efforts if the DBMS employed the support of the USAF Medical Service Health Promotion Program as a quality assurance

agency. In AFR 168-14, USAF Medical Service Health Program, a broad spectrum of related areas (physical fitness, nutrition, stress management, alcohol and drug abuse prevention, and hypertension prevention) are available to support a viable weight management program but no specific tasking or organizational structure for the monitoring of the weight management program is provided. The Health Promotion Program's charter is to promote and maintain the health and well-being of the Air Force community. (18:--)
Weight management efforts should also be included.

Another DBMS area that could enhance the weight management program, especially the 90-day exercise program, is physical therapy. Ironically, the medical community encourages its physical therapists to get advanced degrees in exercise and sports medicine and then fails to include them in the evaluation of overweight personnel for exercise. Normally, the first time the physical therapist sees the overweight individual is after exercise-related injuries have occurred--too late for preventative medicine. If physical therapists are available, they should be consultants for overweight personnel prior to their entry into any exercise program.

The medical community, in the Air Force, is becoming more proactive in providing health information and services for military personnel on weight control issues. The recent inclusion of total blood cholesterol, HDL cholesterol, and

triglyceride determinations for personnel entering the Weight Management Program (WMP) represents a step in this direction. (17:19) Providing this same service to all military personnel may encourage a general awareness of the dangers in high cholesterol levels and may promote better eating and lifestyle habits. All the written material currently available on the adverse effects of high cholesterol levels is not producing the necessary changes in controlling this problem.

Fitness Program

In contrast to the Air Force Weight Program, the Air Force Fitness Program is in sorry shape. Somewhere along the way a good idea got lost. The Department of Defense charged the Air Force to conduct physical fitness training suited to its particular needs and mission. Faced with this challenge, the Air Force embraced the Aerobics concept to physical training. However, through a series of interpretations and modifications, this conditioning and periodic evaluation program evolved into a once a year physical fitness evaluation; an evaluation that provided limited feedback on the actual physical condition of Air Force personnel, as evidenced by the results of the Air Force firefighters and Prime Beef Runway Repair Team studies. How could military personnel who had successfully completed their annual (for the record) physical fitness

test (PFT) not be physically fit enough to do their Air Force mission? Is the aerobics training concept at fault or is the implementation techniques? It is difficult to lay fault on the aerobics concept because the concept as originally expounded by Dr. Cooper is broad, basic and adaptable and is working for the Army, Navy, and Marine Corps. In the process of implementing the aerobics physical fitness program, the Air Force lost the importance of "training the way you fight" and the importance of testing to validate both the training effect and the fighting capability.

After examining the detailed Air Force Fitness Program in AFR 35-11, two logical suggestions for improvement materialize that may be considered by the Air Force. They are:

- 1) actively involving senior leadership in defining the role of physical fitness in the Air Force; and
- 2) returning to the basics and implementing a credible physical fitness program through an Instructional System Development process.

Air Force senior leaderships intervention is essential for a viable physical fitness program. Without their energy and commitment to a more credible training and testing philosophy, all the good intentions and ideas about physical fitness programs will only be rhetoric. Whether the Air Force should adopt an aggressive physical fitness program

similar to the Army or Marine Corps is a decision for senior Air Force leaders. The Army, Navy and Marine Corps programs are tailored to the missions of their services but do offer some excellent parallels for the Air Force to consider. All the other services conduct training prior to testing, test more than once per year, and incorporate both cardiorespiratory and muscular endurance training and testing into to their physical fitness programs.

The information in this analysis on the Army and Marine Corps physical fitness programs was not presented to serve as a condemnation of the Air Force's program but was intended to spark interest in physical fitness initiatives that work. Some of these initiatives could easily be adopted by the Air Force; such as, publishing physical fitness guidelines in a straightforward, concise regulation and supplementing this guideline in a separate publication with detailed implementing instructions.

But before jumping into what to adopt from the other services, the Air Force must wrestle with the fundamental question, is the Air Force serious about physical fitness? Senior leadership in the Air Force professes the need for physical fitness; they publically endorse physical fitness improvement efforts, fully realizing that readiness and sustainability depend upon not only getting the right hardware and software into the inventory but also on

ensuring that our personnel can physically withstand the rigors of combat.

In a technologically oriented Air Force, the question is how much physical fitness is required? Until recently, the senior leadership of the Air Force had been lulled into complacency by assuming from the 1.5-mile PFT's feedback that all was well. However, recent feedback from the field of "pencil whipping" of PFT results, of individuals being injured seriously while testing, and of an overall lack of confidence in the Air Force Fitness Program casts serious doubts about the current program. If the Air Force does not start repairing the shortfalls in personnel physical fitness and Congress discovers them, either through an embarrassing peacetime emergency or during combat, the correction may be mandated. Being forced to confess that the limiting factor in doing our mission is the physical stamina of our personnel and that we knew it but did not implement a viable training program is inexcusable!

The problems with the current physical fitness program are not going to resolve themselves. There is no "quick fix" to resolve the problems it took 20 years to develop. For the past two decades, the Air Force incrementally eroded Dr. Cooper's basic, easily evaluated, Aerobics Program. Incrementally trying to reverse this process is foolhearty. In fact, the logic of returning to basics while ignoring current research may be counter-productive to developing a

viable physical fitness program. A radically new program may evolve. Whatever approach is taken, incremental or radical, it will require the insight of senior Air Force leadership to sort through the myriad of information; to separate the scientists who want detailed research and the implementers who want results; and to provide support for the real need for physical fitness training.

Several years ago the emphasis shifted from Health, Morale, and Welfare (HMW) to Morale, Welfare, and Recreation (MWR) yet, the health and readiness of Air Force personnel deserves both trained physical fitness instructors and adequate physical fitness equipment and facilities; FIT programs deserve qualified instructors assigned to the gymnasiums. The recreation area of MWR is a "soft" responsibility compared to the physical fitness needs of the Air Force. The "H" needs to return to MWR!

Once the senior leadership fully supports and identifies the real need for physical fitness training, then comes the task of implementing a sound program. This time, it is strongly suggested that an Instructional System Development (ISD) process be employed.

Ironically, at the same time the Aerobics physical fitness program was implemented, the Air Force was expounding the effectiveness of ISD as a model for developing and accomplishing training programs. (12:1-1) Whether the ISD method would have saved the original

Aerobics Program is academic. What is important now is can the ISD process revive the present physical fitness program? Although the ISD concept does not have the support it once did, in this instance, the answer is yes. Many of the program pitfalls identified in this analysis could be avoided if the ISD process is followed.

- (1) Determining precisely what the skilled performer does when doing the job, how well he or she must do it, and under what conditions.
- (2) Determining if instruction is needed, and if so, determining what instruction to give the intrained personnel so that they can do the job well.
- (3) Expressing these instructional needs as specific objectives; and devising a test item for each objective so you can know if and when the students achieve the objective.
- (4) Designing instructional procedures and materials to help the students try out the procedures and materials to be sure they are effective. (The measure of success is the students' ability to accomplish the test items described above. If the students fail test items, you will need to redesign the instruction until it works.)
- (5) Conducting and evaluating the instruction; and later, evaluating the graduates as to their ability to do the job. (12:1-1,1-2)

The logic is there, the ISD process is adaptable to the Air Force physical fitness program; that is, if the Air Force is willing to assume a more active role. But, it appears that when the Air Force made physical fitness an

individual's responsibility, they removed the incentive to develop a systemic training process. Since the Air Force's emphasis is on evaluation, why bother with developing a five step, systematic process when the individual would enter it in the final step? Even with this misguided emphasis, the ISD process allows entry at any step. The process is flexible enough to begin at "conduct and evaluate instruction" as long as the next step is "analyze system requirements" and the process continues through the remaining steps.

Applying the ISD model to physical fitness would require considerable work and some skillful manipulation of key players to develop a team approach to this problem. The following "straw man" represents the author's opinion on one way to tackle this problem.

ISD Model for Fitness

Step 1: Analyze System Requirements. Once the need for physical fitness training is realized, the process can begin. Analyzing physical fitness requirements, similar to procedures for USAF firefighters, and listing them as to the standards that must be met, focuses the program on the real issue--the Air Force Fitness objectives of being able to "ensure Air Force members are physically fit to be trained to military tasks; to establish fitness standards which promote the well-being of all military members; and to

support total force readiness." (11:23) The Air Force may elect to develop a generic physical fitness standard that ensures its objectives are met by everyone and a more demanding set of standards for specific groups; such as, firefighters, security police, rated personnel, etc..

Step 2: Define Training Requirements. Once the training requirements are determined, then its time to analyze the physical fitness abilities of those to be trained. Since the majority of Air Force accessions received physical training and a PFT prior to graduation (Basic Military Training School, Reserve Officer Candidate Training, Officer Training School, Air Force Academy) a baseline physical fitness level determination should not be too difficult to establish. During this step, the implementers must consider limiting factors, such as, availability of time, instructors, equipment, facilities, funding and cost. Senior Leadership commitment to a viable physical fitness program is essential at this point.

Step 3: Develop Objectives and Test. The training objectives are drawn from the previous two steps and focus on specific expected performance. What can an Air Force physically fit person do to prove they can do their Air Force mission? This may prove to be the 1.5-mile run and a sit up test or something else, but whatever criterion (expected performance) test items are used they must be measurable. Personnel are rated on what they can do as

compared to expected performance. If personnel fail to achieve the expected physical fitness performance, they may need remedial training or the initial training may need to be changed.

Step 4: Plan, Develop, and Validate Instruction.

Carefully planning the training program that satisfies the physical fitness objectives may require outside the Air Force expertise. The comprehensive US Army Physical Fitness Research Institute at the US Army War College could be used to facilitate a similar validation center at Air University, Maxwell AFB, Alabama. Since the Air Force holds the unit commander responsible for the administration of and compliance with the physical fitness program and a large number of these unit commanders and key supervisors attend professional military education programs (Senior NCO Academy, SOS, ACSC, and AWC), the Base Commander's Course, and the Director of Personnel Course at Air University, it is a logical location for an Air Force Physical Fitness Research Center. Whoever does the planning, developing, and validating of the instructors, the focus must be on fitness training that ensures passing the test.

Step 5: Conduct and Evaluate Training. After the physical fitness training and testing programs have been determined, the training manuals need to detail how the instruction is to be conducted. Combining the information contained in AFP 50-45, and Study Guide KPA 31-127. and

structuring it around the specifics to be taught will produce a viable training aid. The evaluation looks at both the quality of the training and how well the individual can perform physical fitness tests.

Throughout the entire process, feedback provides a continuous flow of information to improve the program. The goal of ISD is to develop the most cost-effective, viable training program through a logical, systematic process and the Air Force could easily adapt physical fitness to this process.

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